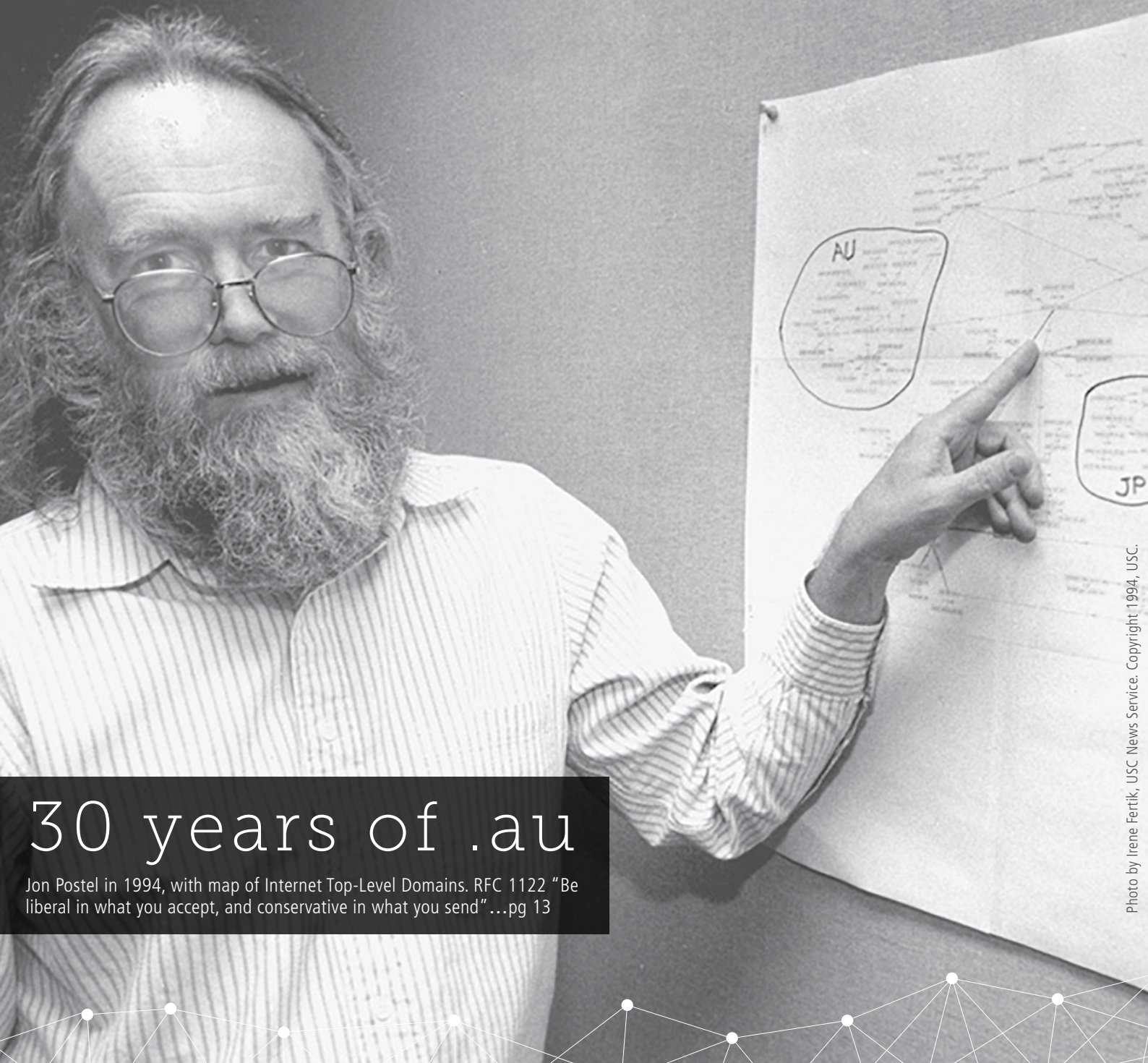


BEHIND THE DOT

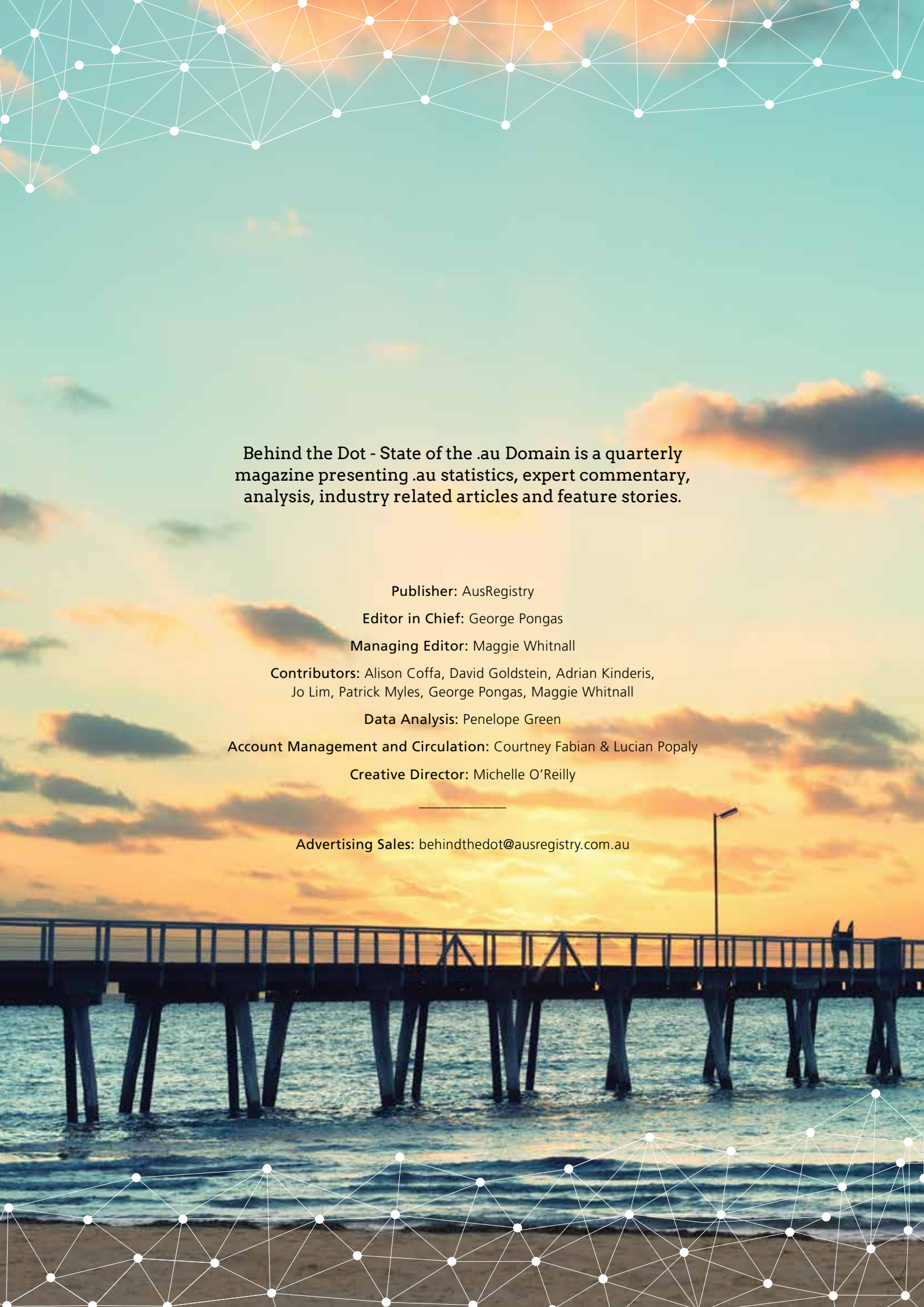
ANNIVERSARY EDITION



30 years of .au

Jon Postel in 1994, with map of Internet Top-Level Domains. RFC 1122 "Be liberal in what you accept, and conservative in what you send"...pg 13

Photo by Irene Fertik, USC News Service. Copyright 1994, USC.



Behind the Dot - State of the .au Domain is a quarterly magazine presenting .au statistics, expert commentary, analysis, industry related articles and feature stories.

Publisher: AusRegistry

Editor in Chief: George Pongas

Managing Editor: Maggie Whitnall

Contributors: Alison Coffa, David Goldstein, Adrian Kinderis,
Jo Lim, Patrick Myles, George Pongas, Maggie Whitnall

Data Analysis: Penelope Green

Account Management and Circulation: Courtney Fabian & Lucian Popaly

Creative Director: Michelle O'Reilly

Advertising Sales: behindthedot@ausregistry.com.au

Contents

DEPARTMENTS

Under the Microscope	7
A look at ccTLD growth and trends in the Asia-Pacific region from APTLD's Patrick Myles.	
.au Research and Surveys	8
A look at the consumer survey conducted by auDA to gauge Registrant interest in .au direct registrations.	
DNS & Security	21
Part two of David Goldstein's discussion with Paul Wilson of APNIC on security in the Asia-Pacific region.	
Governance & Policy	25
Jo Lim reflects on the policy changes in .au's 30 year history and their impact on the success of the namespace.	
Channel Talk	26
News and views from the .au retail channel. This edition: What do you think has been one of the most significant milestones for the .au namespace and why?	
Glossary	29
Abbreviations and definitions of DNS and Internet related terms.	



Visit our website to view more reports
ausregistry.com.au/research-au

FEATURE

Why buy a \$35,000 .au domain name?	9
George Pongas speaks to serial entrepreneur Shaun McGowan about his new business – and its \$35,000 domain name.	
Girls in ICT Day: a challenge to increase diversity	11
Hear about AusRegistry's Girls in ICT Day breakfast featuring Bec Spink, co-founder and Director of Code the Future.	
Direct registrations continue .au's history of innovation	12
George Pongas looks at .au's history of innovation in the wake of approval for direct second-level registrations.	
30 years of .au	13
Behind the Dot takes a look at .au over its 30 year lifespan, examining the history and innovations that have led to this milestone, as well as what's to come in the future of Australia's domain namespace. Read decade by decade as the team reflects, celebrates and looks ahead.	

CHARTS & TABLES

Domain Numbers in the APTLD Region	7
.au Domains Under Management	7
.au Monthly Creates	7
Renewal Rates by Domain Age	7
General Public	8
Existing Registrants	8
Businesses with web presence	16
Registrars Managing .au Domains	17
Domains Under Management	19
.au Policy Deletes (and Reinstatement Rate)	25



3,035,915
.au domain names
currently registered

30th June 2016

Foreword



Welcome to the eighth edition of *Behind the Dot: State of the .au Domain* – an edition of particular significance as we celebrate 30 years of the .au namespace.

It is perhaps more accurate to think of .au as being ‘30 years young’. Although 30 years behind us sounds like a long time, in an industry as dynamic as this I get the feeling we are but babes.

I personally, have been associated with .au for 17 years. My first ever deliberate interaction with .au was just like anyone else’s; I was looking to help start an online business, so I registered a .au domain name. At the time the namespace was significantly more closed than it is today – I had to get an ABN in order to register a domain name, and it had to be a direct derivative of the business name.

However even then, I recognised that domain names had an important role to play as signposts for the Internet. I saw that this would be very significant in the future, and it led me to become an active member of the Internet industry – and specifically, the world of domain names.

One characteristic of the Internet is that it is continually evolving: a rapid evolution that spans across all sectors including applications, utilisation, delivery and reach. The one constant from its inception however, is that users will always want genuine, trusted and authoritative content. As the perennial signposts of the Internet, domain names are at the core of that want. From the days of very closed namespaces and restricted options, to policy changes that have increased availability and choice, to the challenges of a booming online world where building trust becomes more difficult, and through to today we’ve almost come full circle. Domain names are now thankfully returning to the fore as trusted signposts, as the domain name industry matures and looks to confirm its role as a core player in Internet navigation.

Domain names are the comfortable constant in a fast paced and dynamic online world. Search has quickly become the solution to a saturated, content-rich internet, bringing with it an entirely different set of issues. Social media platforms come and go, each striving to achieve ultimate popularity. The one thing that is constant throughout the entire evolution of the Internet so far is domain names.

We’re not going to be without our challenges however, and the more innovative we can be around our domain namespaces; the more we can be proactive about and support innovation, the better placed domain names will be to serve the public. One thing we’ve learned about the Internet is that the path of least resistance always wins. If domain names can’t be along that pathway then we won’t succeed.

When auDA introduced the new competition model for the .au namespace on July 1, 2002, it felt like a real milestone was reached. Despite all the work involved in getting to that point, at go-live we at AusRegistry knew we’d only made it to the starting line. There was still much work to do.

Then in November 2007 the namespace reached 1 million .au domain names and there was an undeniable sense that .au had ‘hit the big time’. Each milestone we reach is testament to the fact that the .au community has been open to change and supportive of innovation.



It would be remiss of me if I didn't touch on how we got here. In the time that AusRegistry has been involved in .au, our role has remained the same. We need to run a reliable, predictable, highly resilient and available service. Our job is to make sure .au works – all the time. We are of course here due to the support of auDA, playing its role from a regulatory standpoint and supporting innovation.

Our industry also benefits from the passion and ongoing work of the innovators; the investors, web developers and Internet users finding unique and creative ways to use and grow the namespace.

But the heroes of .au are the ones in the trenches, talking to the public and turning .au into the sellable product that it is – the Registrars and retailers. We've had a long history of working closely with our Registrars, trying to understand what makes their businesses better, faster and stronger. What we sell as a Registry is virtual; a piece of online real estate. The Registrars transform .au into a three-dimensional product. They give life to a domain name because they make it function, and make it the signpost that it is.

30 years of .au is a significant milestone, and one we recognise and celebrate in conjunction with all those who have contributed to the namespace's growth and success thus far. But it is also a chance to look ahead – to remind ourselves that in today's environment of "disrupt or die", innovation and an ability to be nimble to the demands of the market will be key to sustaining this success into the future.

We look back proudly at having played our small part in the development of .au. As I have already commented, we are but babes. I get the feeling .au has plenty more challenges and opportunities as it reaches its next phase of evolution.

I am pleased to present this special edition of *Behind the Dot: State of the .au Domain*. As always, we welcome your feedback and input on the magazine and thank you for reading.



Adrian Kinderis
CEO, AusRegistry

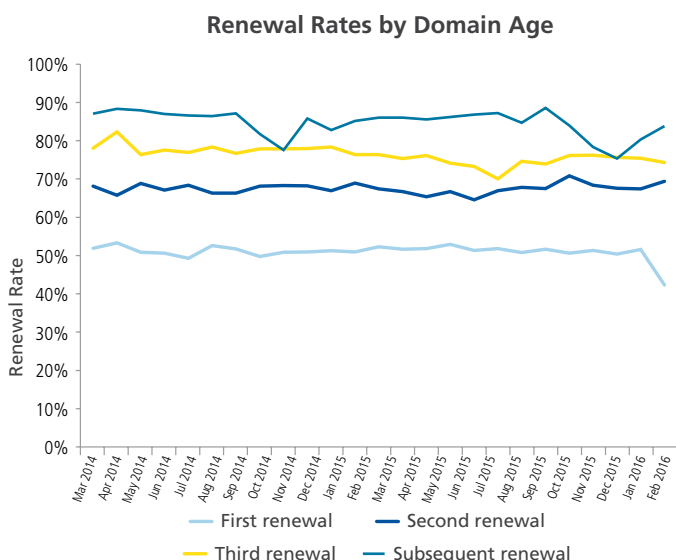
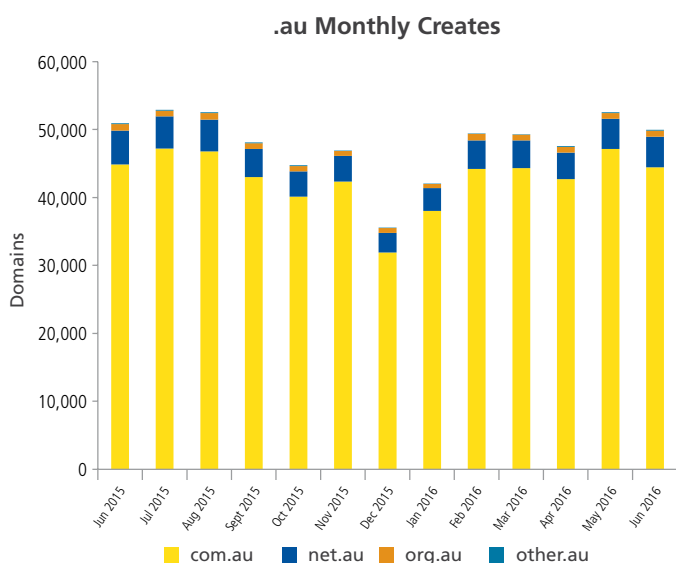
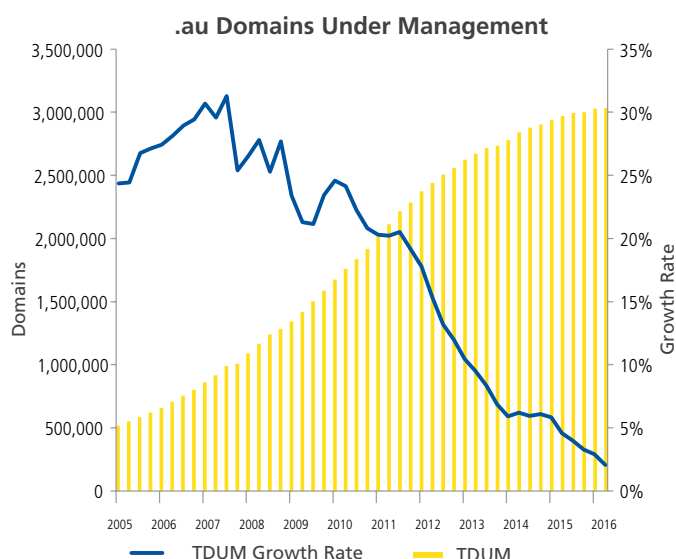
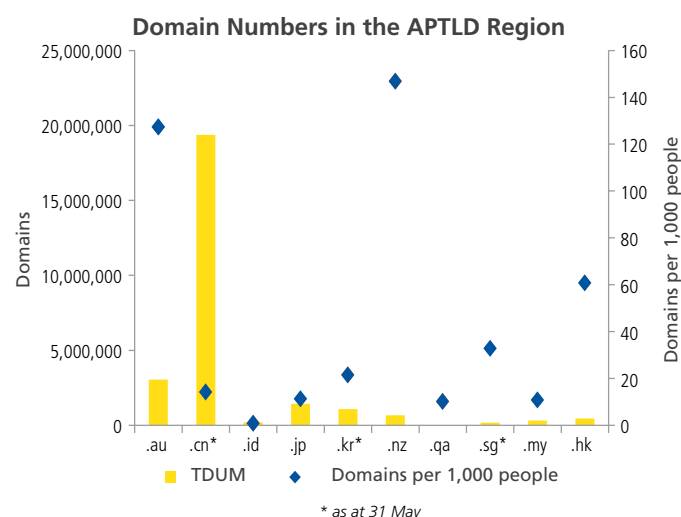
Under the microscope

Combined domain names across ccTLDs based in the Asia Pacific region is estimated to be 30 million – roughly 21 percent¹ of the global ccTLD market. Median ccTLD growth over the first quarter 2016 was 0.9 percent with the highest growth recorded from .cn (China), .hk (Hong Kong) and .id (Indonesia).

The median growth represents a sharp decrease as compared to Q4 2015 which saw the effects of a Chinese domain investment boom. For the local Chinese ccTLD (.cn), the 12-month growth rate as at April 2016 was almost 60 percent – a number well beyond average ccTLD growth rates and particularly noticeable considering its status as largest ccTLD by zone volume. The Chinese investment boom has also made a significant impact to the global TLD market with many gTLDs and ccTLDs experiencing above average growth. For example, .com saw a threefold increase in average monthly growth rates, as did ccTLDs as far as Europe with some even noting they received pressure on their pricing from Chinese registrants eager to buy up premium and short domains. The reasons for this boom are less clear. Industry reporting as well as conversations with those close to the source suggest the change may be due to a general maturation of the Chinese Internet economy, along with new pushes from the Chinese government on innovation and ICT development. While some ccTLD operators don't believe the new sales to be sustainable, others prefer not to under-estimate Chinese influence given its relative size and rate of development.

More generally, a challenge for ccTLD operators globally will be to ensure they remain relevant and that their products (the ccTLDs themselves) are well positioned. This is particularly important given the arrival of many new substitute products over the past two years – new gTLDs. The competition is not only because end users have more TLD choice, but also as the sales channels of the ccTLDs have that same choice creating a shift in power from registry to registrar. Sales, barriers to entry and branding are all more important than ever for ccTLDs.

¹ Median sample = 16 ccTLDs in Asia Pacific region





.au research and surveys

In February 2015 a Names Policy Panel was appointed by the auDA Board to review the policy framework underlying the allocation and use of domain names in the .au domain space. Panel members represented a wide range of stakeholder interests, including industry, consumer, government and legal.

Twelve months later, the Board held a full discussion of the Panel's final recommendations in relation to direct registrations and felt it prudent to commission some independent market research to test the Panel's assertions. Importantly, the purpose of the market research was not to find out whether people think introducing direct registrations in .au is a good idea – this was the focus of the Panel's work, and the Board was clear that it did not wish to repeat what the Panel had already done. Rather, the purpose of the market research was to assess the likely level of market demand. To this end, it was agreed to conduct a simple, one-question survey aimed at finding out whether or not people would register "yourname.au" if it was available.

The survey was sent to 97,000 registrants from a stratified random sample of the com.au, net.au, org.au, asn.au and id.au zones. The survey was also sent to a representative sample of the general population provided by the market research company. In summary, the results showed that 60 percent of respondents would be likely or highly likely to register "yourname.au" if it was available.

The Board noted that the independent market research results closely corresponded with public comments received by the Panel, which showed that approximately two-thirds of respondents favoured direct registrations. The Board was satisfied that both the Panel's work and the independent market research supports the view that introducing direct registrations would be of benefit to users of .au, and for this reason it has decided to proceed.

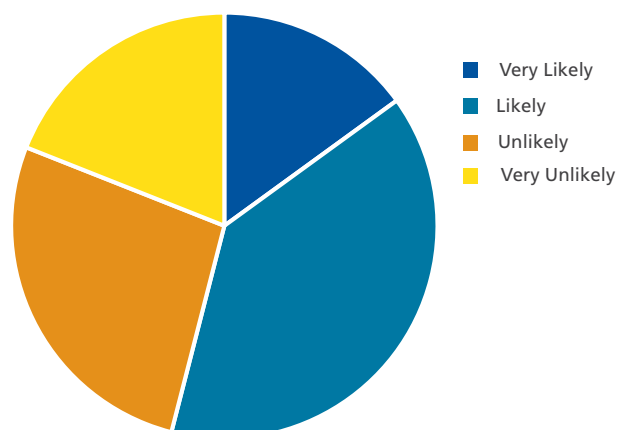
The full survey results are located here: <https://www.auda.org.au/assets/pdf/board/Board-market-research-results-14-04-16.pdf>

This report has been reproduced with the permission of auDA.

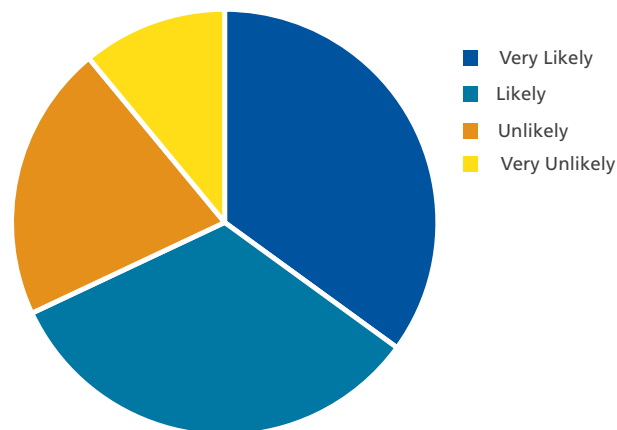
Survey respondents

Likelihood of registering a direct registration in .au - ie yourname.au

General Public



Existing Registrants





Why buy a \$35,000 .au domain name?

By George Pongas
Director of Product Management at AusRegistry



Choosing the perfect name for your company is a challenge every startup experiences. You must check existing company name registrations, trademarks, brands and product names – both within Australia and internationally if you have global ambitions. If you make it through this quagmire you then need to get the domain name too.

How critical to success is the perfect domain name? George Pongas met with Shaun McGowan, serial entrepreneur to talk about the importance of his investment for a perfect domain name for his new venture. Mr McGowan is an Internet Hotel Builder, Co-Founder of CarLoans.com.au (acquired in 2014 and part of publicly listed company Eclix (ASX:ECX)), and now Co-Founder of Lend.com.au.

GP: [Shaun why Lend.com.au?](#)

SMG: We offer small business loans to Australian businesses. Our experience with the CarLoans.com.au domain name meant we knew we had to get the most relevant domain name we could. Unfortunately the main keyword domain name was being used by a competitor, so I had to find an alternative. We believe “lend” is a perfect match. The word “lend” represents loaning money. It took us about six weeks to acquire the domain name from start to finish.

GP: [Recently the Nine Network revealed its new website at www.nine.com.au to replace the existing www.ninensn.com.au. It's another example of a short,](#)

simple domain name being held in great value by an organisation. Why is the right generic domain name so important to your business?

SMG: Simple, it's about consumer perception. When you own a generic domain name it does two really amazing things for you instantly;

1. Increases recall so people actually remember the address
2. Increases Click Authority, leading people to trust you

If I sell ice cream, I want the best shop, in a sunny tourist location, close to the beach which will give me a huge amount of foot traffic. Even if my ice cream isn't the best, I'll still be busy. I can likely charge a premium because I know I'm the closest ice cream shop for three blocks (although it's obviously better if you do have the best product too). You also know any competing ice creamery business owners would love to own this shop location too. This gives you the safety that if your business doesn't succeed you will have an asset that you could sell on. I call this “burn value”.

This is how you must think of domain names. The best shop, in the best location, with the most foot traffic. Everyone who understands the Internet wants this ‘real estate’. This is why every day, many domain names are sold – some for millions of dollars.

GP: *So what is 'Click Authority' and why is it important?*

SMG: Click Authority translates to trust. People click and visit websites they trust more often – and this traffic in turn converts to sales.

People who do not have a generic domain name face spending thousands, if not hundreds of thousands of dollars developing and promoting their brand to establish brand awareness and consumer trust. The way I look at it, I gave my business a head start and bought this Click Authority advantage inherent in the generic domain name for just \$35,000.

GP: *But it is a brand new website – will this advantage still apply?*

SMG: That's true. However, because my domain name is so brilliantly relevant, consumers naturally assume I have been in business a long time, I mean, how else would we have the domain name? There is a perception that we must have registered this a long time ago to get it and therefore have been in business a long time too. It is all about psychology.

GP: *So what does this mean for your business?*

SMG: I don't have to explain what we do and how we do it, consumers just get it. I always get a higher conversion on every metric, from Google, to leads, to sales. Every part of my sales funnel increases because I have a strong, generic and ultimately authoritative domain name.

GP: *Will your website rank higher in search because of the domain?*

SMG: To rank on search any website takes time, but yes, I believe I will rank higher because of my domain.

Google has over 200 ranking signals to define their search results and one of them is best explained as 'leap frog'. If I rank below you, say in position four, and you rank above me in position three, and more people click on my domain name in the search result more often than yours, I will 'leap frog' you. You drop to position four and I move up to position three – and that's my Click Authority returning dividends against my \$35,000 investment.

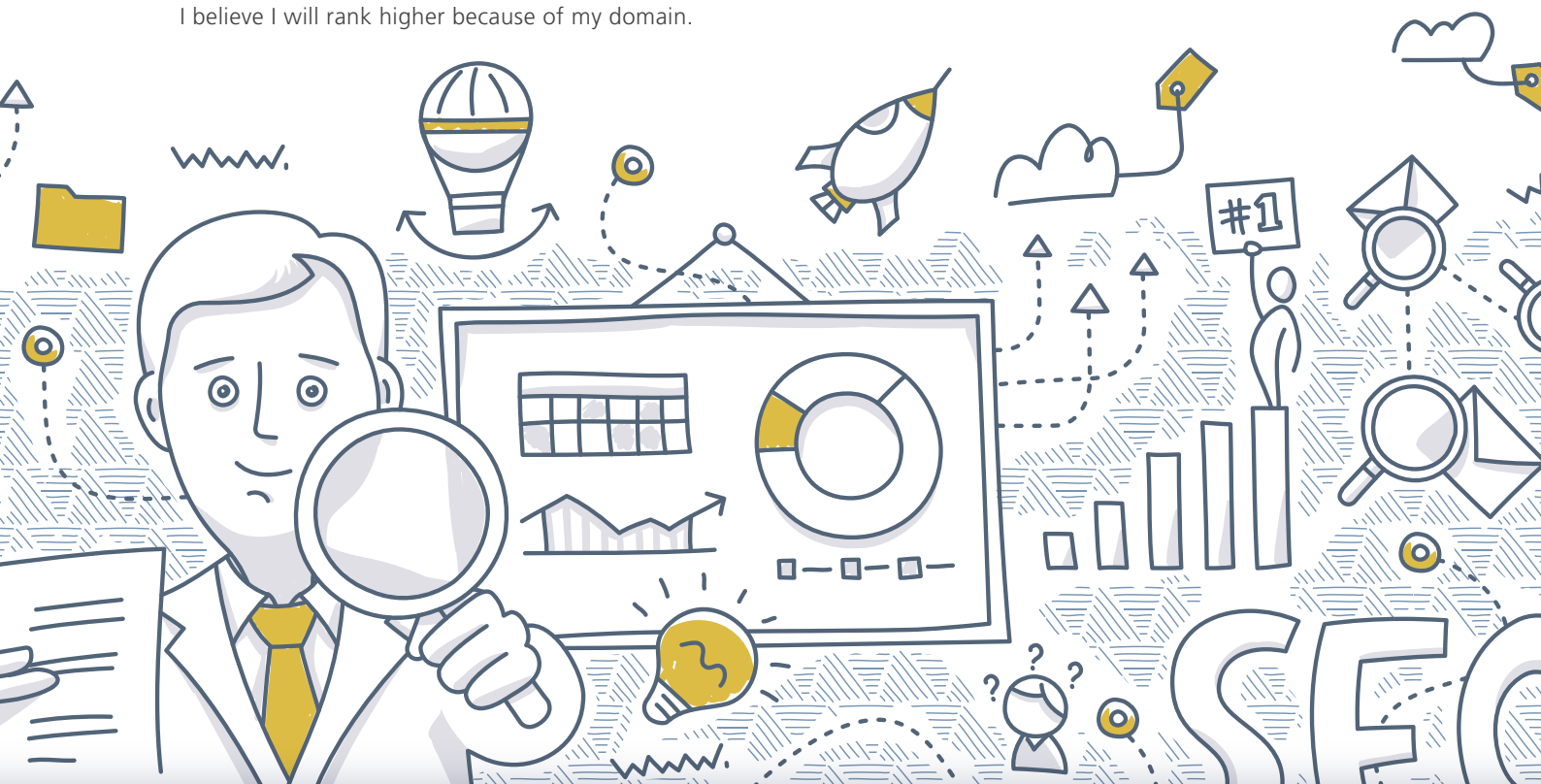
GP: *What about the impact on Google AdWords campaigns?*

SMG: Great question. Based on the exact same principles as discussed above, I believe I'm going to get a greater share of clicks on the exact like for like ad against somebody who doesn't have a generic domain. It's just how it works, and my Click Authority is now helping to improve my AdWords conversions – which translates to site visits – and in turn if I am doing my job well, the increased traffic is converting to more sales.

GP: *What's your best piece of advice for business owners regarding domain names?*

SMG: I always advise people to buy the best name they can afford to get. Sometimes you will get lucky and not be asked to pay a lot. Other times, however, you're really going to have to pay for it. If you cannot afford an upfront purchase, offer to lease it for a monthly fee with a buyout option.

GP: Thank you, it has been a pleasure talking to you and I wish you the best of luck for your new venture. Although, with such well thought-out planning, luck clearly plays a limited role towards your many successes.





Girls in ICT Day: a challenge to increase diversity

By Alison Coffa

Marketing Communications Coordinator, AusRegistry



International Girls in ICT Day is an annual event aiming to empower and encourage young girls and women to consider careers in information and communication technologies (ICT).

A global initiative of the International Telecommunication Union (ITU) – the United Nations specialised agency for ICT – Girls in ICT Day has been celebrated in 150 countries around the world since 2011, engaging with more than 177,000 girls and young women.

On April 28th AusRegistry marked Girls in ICT Day with a breakfast event in Melbourne, attended by around 40 women representing the technology, business, legal, government and education sectors. The focus of the event was to look deeper at the relationship between industry and education and to discuss ways in which businesses can support those engaging girls in technology at a young age.

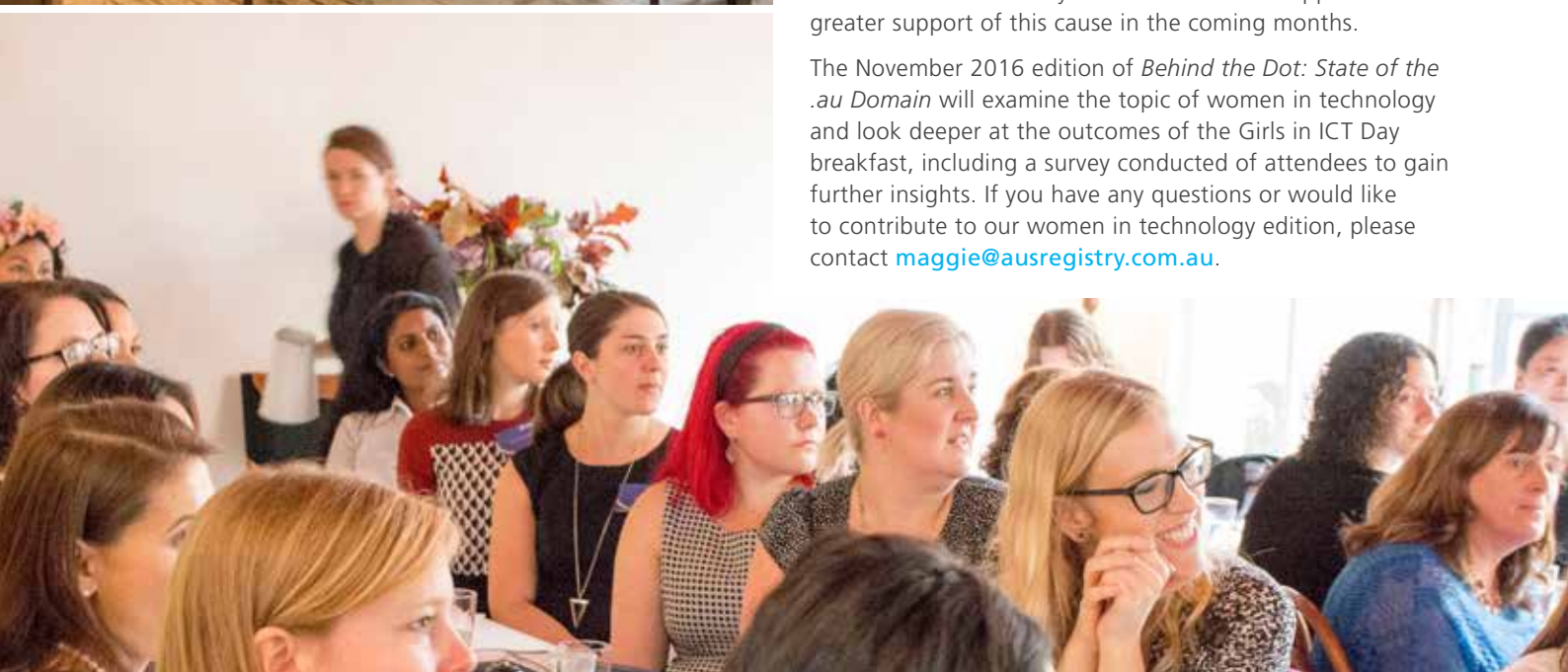
A highlight of the morning was the presentation from Bec Spink, co-founder and Director of Code the Future and an educator by trade. Code the Future is a non-profit organisation pairing schools with professional developers to run coding workshops and classes for students.

Ms Spink discussed the trends she and other educators have observed around girls' engagement with ICTs, highlighting the importance of beginning this process early – as research has suggested many girls dismiss the idea of a career in ICT before the age of 15.

She concluded with a challenge to all the women in attendance to be aware of the young women in their lives and be the voice that encourages them to consider technology fields as a potential career path. Ms Spink's presentation was incredibly engaging and motivating, and AusRegistry extends its thanks to her again for her participation.

The breakfast was a wonderful chance for a cross-section of industries and organisations to come together and share ideas. AusRegistry is now assessing the feedback and discussions from the day in order to examine opportunities for greater support of this cause in the coming months.

The November 2016 edition of *Behind the Dot: State of the .au Domain* will examine the topic of women in technology and look deeper at the outcomes of the Girls in ICT Day breakfast, including a survey conducted of attendees to gain further insights. If you have any questions or would like to contribute to our women in technology edition, please contact maggie@ausregistry.com.au.





Direct registrations continue .au's history of innovation

By George Pongas
Director of Product Management at AusRegistry

Recent milestones such as the 3 millionth domain name registration and the 30th anniversary illustrate that .au is a well-established, trusted product in the Australian market.

The namespace saw its strongest performance during the growth years of 2002 to 2010 (read more on this in the earlier *30 years of .au* article in this magazine). Prompted by market forces, growth is now beginning to plateau as .au settles in its maturity stage.

But is growth important? There is a popularly held position to suggest that 3 million names 'feels' about right for a country with Australia's population size. Perhaps it is in 2016, but are we happy to see Australia's digital economy fixed at today's size? Growth is important because every year more and more are engaging online, and I believe it is imperative for the .au namespace to remain the preferred domain choice. Growth is a measure of good market fit and product relevance, particularly in the increasingly competitive online environment.

There can be no denying that the introduction of new Top-Level Domains has created increased competition, and we're also seeing considerable encroachment from search engines as the default tool for navigation.

The product lifecycle theory suggests that when a product reaches maturity, focus shifts to maintaining market share and investing in marketing and "product modifications or improvements to the production process".

Over the last 30 years the success of .au is testament to the product's ability to evolve and innovate in order to remain relevant and competitive. Namespace growth has seen repeated surges through developments such as the establishment of auDA; the introduction of competition between Registrars; and numerous policy changes such as

to release previously reserved generic domain names, to allow monetisation and open participation by domain name investors by allowing aftermarket sales.

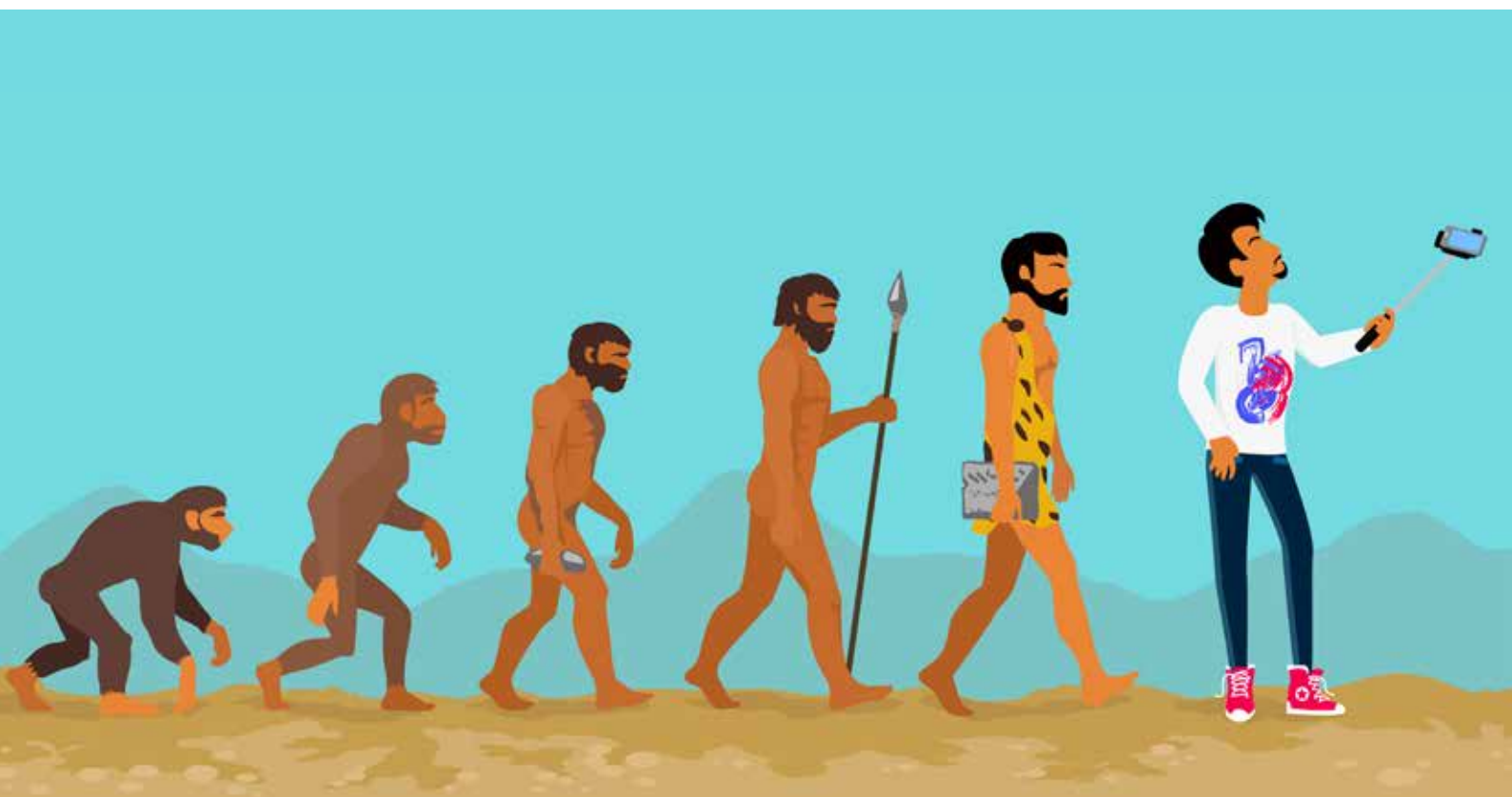
The most effective way to reboot a mature product is through innovation and for a domain name you go about this by looking at policy changes. The recent announcement by auDA of the Board's decision to open up registrations under .au at the second-level is precisely the innovation needed to ensure the namespace remains relevant for Australian Internet users. Not just people buying domain names for their business or personal needs, but also for those who use domain names to access any online service or content.

The .au extension is a signifier to Internet users of trusted, quality Australian content. The annual .au survey has consistently illustrated this fact, with the 2015 survey finding that two-thirds of respondents who hold .au are doing so because it best represents Australian organisations, and two-thirds of respondents are more likely to trust a website that ends with .au.

Recently, other country code namespaces including .uk and .nz have made the decision to open up direct registrations under their country's Top-Level Domain. Direct registrations under .au will now allow Australians to also point directly to the .au as the online 'seal of authenticity'.

Australia's history of innovation and reinvention cannot be underestimated. In order to future-proof this most valuable digital asset, we must continue to apply this inventiveness to the .au namespace to ensure its continued growth, security and strength.

Disclosure: George was a member of the 2015 Names Policy Panel and has been a supply class director on the auDA Board since October 2015. George abstained from the auDA Board's vote on the decision to open up .au for direct registrations.





years of .au



1996 – 2006

2016 – 2026

1986 – 1996

2006 – 2016

www.30years.com.au

1986 – 1996

In 1986, a year after the Internet domain name system was deployed, Australia's .au country code Top-Level Domain (ccTLD) came into being at the approval of the University of Southern California's Information Sciences Institute (performing IANA's function at the time). The administrator, Jon Postel

delegated management of the .au domain to Kevin 'Robert' Elz, a network programmer at the University of Melbourne.

Seen as a pioneer in establishing Australia's connection to the world via the Internet, in the 1980s Mr Elz was heavily involved in the establishment and management of the email systems connecting Australian researchers and academics to communities around the world – including the first ever exchange of Internet messages internationally from Australia in 1989. As reported by AARNet¹, "on the night of June 23, 1989 Robert Elz of the University of Melbourne and Torben Neilsen of the University of Hawaii completed the connection work that brought the internet to Australia."

He went on to be appointed as the Australian representative on the International Internet Architecture Board, the only Board member outside USA and Europe.

Mr Elz held the .au administrator position in a voluntary capacity from 1986 until the early 2000s and was responsible for the introduction of the second-level domain name structure (2LDs). At the time, these included: asn.au, com.au,

conf.au, csiro.au, edu.au, gov.au, info.au, net.au, org.au, and oz.au.

As well as the management of these 2LDs, Mr Elz's original qualification in Law led him to develop a "policy rich"² approach to the namespace, establishing policies for eligibility and abuse mitigation.

“Mr Elz managed the .au ccTLD's in a voluntary capacity from 1986 until the early 2000s”

With such a high number of 2LDs to manage, Mr Elz sub-delegated edu.au, gov.au and info.au to Geoff Huston from Australian Vice Chancellor's Committee (AVCC), net.au to Hugh Irvine of connect.com.au and asn.au to Michael Malone from WA entity, Connect West. Mr Elz was responsible for managing com.au, org.au, id.au and oz.au and for developing the overall 2LD policy. (The CSIRO also had access to the 2LD csiro.au, which was managed in-house.)

Demonstrating the changing times, 1994 marked the first time that the Australian Bureau of Statistics (ABS) surveyed businesses on their use of information technologies. The Business Use of IT survey in 1993-94 found that 49.4% of businesses had computers (211,548 in total) and these businesses accounted for 82.6% of total employment. The survey excluded agricultural businesses and businesses without employees.

However, the survey also found that only 30.5% of employees (1.6 million) used a computer once a week or more. The focus was on the capital expenditure

on IT equipment and 25.3% of designated information technology and telecommunications professionals were primarily involved in data entry³.

Due to the rapidly growing nature of domain registrations in Australia (prompted by the increased activity and commercial growth in the Internet), it became evident that com.au required a more dedicated focus. In October 1996, Mr Elz granted a five-year license to the University of Melbourne through its commercial arm, Melbourne IT Ltd.

At this point in time the commercialisation of the domain name industry began in Australia. Melbourne IT began to charge for domain name registrations and quickly built a business around domain name services.

It was however becoming more and more evident that a structured and coordinated approach to the management of the .au ccTLD was required in order to meet the rapidly evolving nature of the Internet in Australia and around the world.

Narelle Clark



Narelle is Deputy CEO at Australian Communications Consumer Action Network (ACCAN) and has been involved in

issues of Internet use, construction and research through roles in universities, telecommunications companies, CSIRO and the Internet Society. Narelle is currently a Board member at Internet Australia.

In 1986 I was working for a now defunct Australian pacemaker company with an email address in the .oz domain. At the time, you could type a single command and on a single screen see all the computers listed on the network: everywhere. It was absolutely awe inspiring. I left there to work for UTS and AARNet where we were starting to build out campus networks and into

¹ AARNet; "20 Years of the Internet in Australia" <http://mirror.aarnet.edu.au/pub/aarnet/AARNet_20YearBook_Full.pdf>

² Pearcey Foundation "Kevin Robert Elz", 2013 Pearcey Hall of Fame <<https://pearcey.org.au/2013-hall-of-fame/>>

³ Australian Bureau of Statistics; 8129.0 "Business Use of Information Technology, 1993-94" <<http://www.abs.gov.au/AUSSTATS/abs@.nsl/allprimarymainfeatures/A2C93750AAA4820BCA25722E001BFE3C?opendocument>>

nearby agencies like hospitals and the ABC. People are often surprised when I recall the days when the whole country ran off 128kbps to the USA and 2Mbps between capital cities.

Everything we did was on the basis that it seemed like a good idea: such as email for every student and staff member or dial up access to the university. Along came this new-fangled web server thingy in the early 90s and it seemed like a good idea also.

The first site was the university's own web site and library information system, then someone on campus wanted to put legislation on another, and that became the Australasian Legal Information Institute (Austlii) – still here today and both still tremendously useful.

“ I recall the days when the whole country ran off 128kbps to the USA and 2Mbps between capital cities ”

Of course by then we'd abandoned .oz and adopted the more familiar .au as well as edu.au and the other Australian second-level domains.

When first at UTS, my lab's main computer connected directly to the campus wide area network or WAN (and onto the world) via a breakout box and a makeshift cable into the router. It didn't take too much figuring out to get it going and security was not even considered. Then along came the Morris Worm in 1989 and many of us realised that security was crucial and had to be taken into account. Some people still seem to have missed that lesson today.

It struck me then that we could – and should – connect every piece of

laboratory apparatus possible in the university, as well as get a computer onto every staff member's desk. In that way we could break up the sampling, testing, analysis, publication and discussion of results, and broaden access worldwide. We've got the libraries and publications side working, but we are only just now getting to connecting all the objects via the Internet of Things. I always thought we'd do that a lot earlier, but the networks needed to be built first!

Dr Peter Thorne



From 1989 Dr Peter Thorne was Head of the Department of Computer Science at The University of Melbourne. One of

his staff members was Robert Elz, a prodigious, technically brilliant programmer who was a national and international figure in the computer networking community.

Dr Thorne says about Mr Elz: *“During that time Robert displayed exemplary dedication to computing. It was the early days of computer networking and Melbourne University was at the forefront. Robert was not only co-founder of what was to become the Australian Computer Science network (ACSnet), he was a pivotal figure in bringing the Internet to Australia.”*

Robert (or “kre” as he was widely known) was responsible for the first real internet exchange between Australia and the rest of the world on June 24th 1989 AEST. He became personally responsible for the domain name allocation of the .au ccTLD. In fact, the Department of Computer Science at the University of Melbourne hosted the .au server for quite some time. Robert's work with .au was all voluntary. He would work 18 hour shifts and later, due to an extraordinary workload, he delegated some of the second-level domains to associates to manage.

A man of true integrity, Robert Elz never sought financial reward from an industry that has reaped so much benefit from his pioneering efforts. As for recognition: the computing community believe he deserves more than what is currently bestowed on him. When I contacted

“ Robert was responsible for the first real internet exchange between Australia and the rest of the world ”

Robert in 2013 about his entry into the Pearcey Foundation's Hall of Fame (the Pearcey Foundation is an organisation that raises the profile of the Australian Information and Communications Technology industry and profession), humble to the core, Robert mentioned he was part of the past and not interested in receiving accolades.

Robert was also instrumental in the establishment of the Internet in Thailand and Papua New Guinea. In fact, when I was speaking at a computing conference in Thailand, it became clear that Robert Elz is revered in that country. In Australia, by comparison, he is an unsung hero.

Dr Peter Thorne was formerly the Head of the Department of Computer Science at The University of Melbourne and Deputy Dean of the Faculty of Engineering until 1999. He has been a member of numerous State and Federal advisory boards and a Director of Computer Forensic Services Pty Ltd, a company providing expert advice in computer disputes and litigations. For the last 15 years Peter has led a team researching and documenting Australia's pioneering achievements in computing.

In 2016 Australian Computer Society (ACS) celebrates its 50th anniversary.

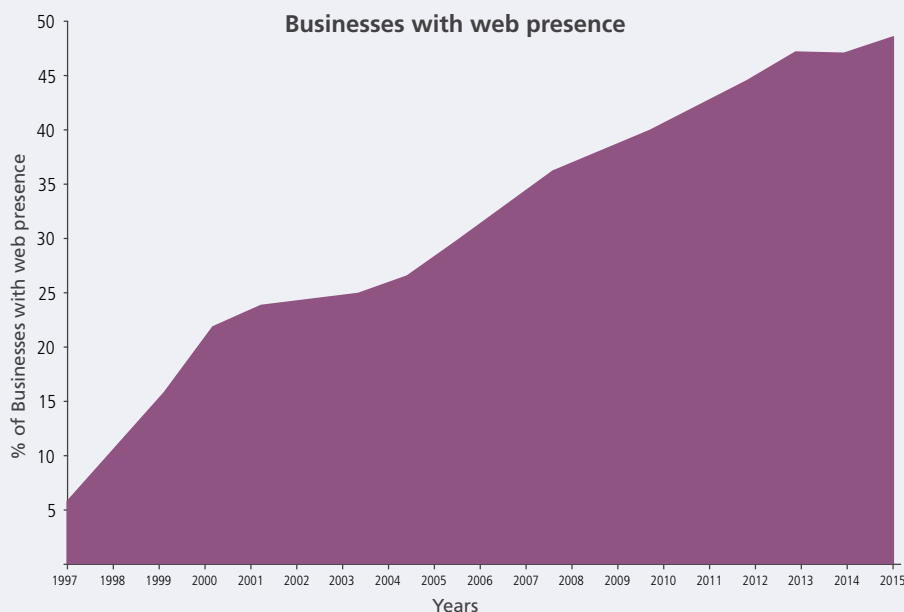
A growing Aussie Internet

1996 – 2006

1996 was a turning point for the management of Australia's online namespace. According to reporter Jenny Sinclair⁴, "by late 1996, Elz had a backlog of thousands of .com.au names to process. As he said in [a previous] Four Corners forum, "People were starting to get desperate for .com.au registrations to get handled more quickly than I had been able to."

Following Mr Elz's transfer of com.au operations to Melbourne IT, eventual disagreement about the way .au was being run led to demand for a regulatory body to oversee the namespace. Initially, an organisation was formed called Australian Domain Name Administration (ADNA), though structural difficulties led to a regrouping by the Australian Internet community and the emergence of the body now known as .au Domain Administration (auDA) in April 1999.

auDA was officially endorsed by the Australian Government as the appropriate body to administer the .au domain namespace in December 2000, establishing it as the policy authority for .au and the body responsible for overseeing and deploying new technologies and initiatives in the .au namespace, such as IPv6, DNSSEC and the auDA Information Security Standard (ISS). For more information on these initiatives, check out previous editions of *Behind the Dot* or visit the auDA website.



Technological tides turn

One of the most interesting illustrations of the way the Australian Internet landscape has developed is the various surveys and studies conducted by the ABS and their evolution over the years.

Looking at how results have changed year on year, and even how the surveys themselves have been updated to reflect societal and technological developments, provides a fascinating insight into how the business and tech landscape of the country has evolved.

Research data related to business use of information technologies (IT) and household use of IT and the Internet illustrate 1996 to 2006 as a time of rapid development and change, evening out to a period of stability and slowing growth in the last few years of this decade.

Businesses going digital

The ABS Business Use of IT survey is perhaps the strongest indicator of how quickly various technological

developments became a part of daily life in Australia. By 1997-8, when the survey was conducted for the second time, the number of businesses using computers had jumped from 49.9% to 63%⁵. Around this time, the focus of this survey shifted from the presence of computers alone to include use of the Internet, which in 1997 was reported at 29% of businesses surveyed. This rose rapidly in the few years that followed, reaching 56% in 1999-2000 and stabilising at around 81% by 2005-2006⁶.

In the subsequent years, the survey evolved again and in more recent times, has focused more on factors such as social media presence or cloud computing. The simple appearance and then removal of questions around computer and Internet usage demonstrates how rapidly these factors became a novel, then accepted, and later engrained part of the business landscape in Australia throughout .au's second decade in operations.

⁴ Erica Schlesinger Wass (ed); "Addressing the World: National Identity and Internet Country Code Domains", Chapter 14: Australia's .AU: Australia's Second Gold Rush. Published September 2003 <<https://rowman.com/isbn/074252809X>>

⁵ Australian Bureau of Statistics; 8129.0 "Business Use of Information Technology, 1997-98" <<http://www.abs.gov.au/AUSSTATS/abs@.nsf/allprimarymainfeatures/2588BB48AE27867FCA25709A000A30B2?opendocument>>

⁶ Australian Bureau of Statistics; 8129.0 "Business Use of Information Technology, 2005-06" <<http://www.abs.gov.au/AUSSTATS/abs@.nsf/allprimarymainfeatures/1E26824982FB57F2CA257617001928C5?opendocument>>

Use of technology at home grows

Similarly to the Business Use of IT survey, research into the use of computer and internet technologies in the household began in the mid-1990s, with the 1996 report finding 30.6% of households had a computer and 26% of those with a computer had a modem – which were beginning to overtake fax machines in the home⁷.

Around this time, the ABS also began tracking the use of mobile phones, which rose rapidly from 30% of households in 1996, to 61%⁸ in 2000 and then to 72% by 2002.

In 1998, 45% of Australian households had a computer⁹. To place this in perspective, 1998 was also the year the first generation of the Apple iMac computer debuted. That year, the survey also began to ask about Internet use at home which was recorded at 16% of households. This number grew rapidly, reaching 61% by 2002, at which time computer use began to stabilise, and the growth rate of Internet use continued, but began to slow.

A new Registry for .au

With the introduction of auDA came a chance to review, update and strengthen the policies surrounding the .au ecosystem. One of the major decisions, as recommended by the Competition Model Advisory Panel, was to keep the namespace as open as possible and encourage competition at both a Registry and Registrar level. As such, the provision of domain name services was put out to tender in 2001.

In December 2001, auDA awarded the Registry tender to a subsidiary of RegistrarsAsia called AusRegistry. In making the announcement, then CEO of AusRegistry Simon Delzoppo expressed the company's dedication to the project and understanding of the weight of this

responsibility; "We are very pleased to accept this challenge. Today marks a significant move forward for the Domain Name industry in Australia. AusRegistry is committed to meeting the stringent technical requirements as outlined in auDA's Request for Tender document."

Initially signing a four-year agreement with auDA, AusRegistry has since continued its role as the Registry for .au and marked milestones such as the 3 millionth domain name registration under .au and the 30th anniversary of the namespace.

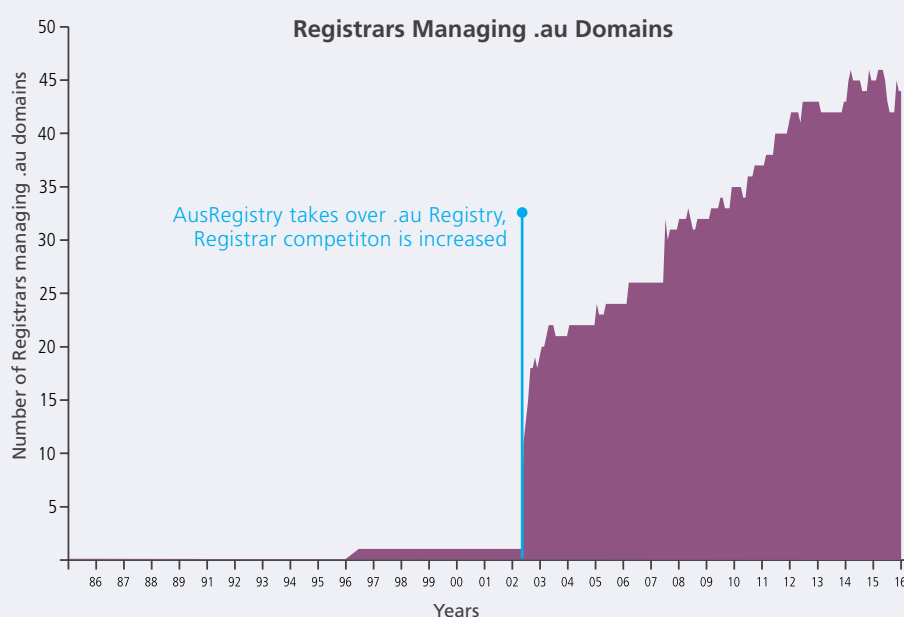
.au growing with the Australian Internet

In July of 2002 AusRegistry – as the new Registry – was bestowed the care of 282,632 domain names¹⁰ under management in the open second-level domains (2LDs) of .au. (Measurement of growth prior to this time is difficult as the data is either incomplete or unavailable at the time of writing.) In the first month of AusRegistry's operations alone, this grew by over 3,000 domain names were registered and by the end of July, there were 286,099 domains under management across all 2LD .au zones.

Over the next few years, .au experienced a time of immense growth. Along with the rapidly increasing use the Internet and ICT in general, auDA also made a number of policy changes from 2002 to 2006 that likely contributed to the uptick in registrations.

In 2002, the restriction limiting entities to ownership a single domain name was abolished, and instead a rule was introduced requiring a 'close and substantial connection' in the registration of domains under the open 2LDs. Also that year, rules against the registration of generic com.au domain names such as flowers.com.au were lifted and registrations increased dramatically. Evolution of the namespace continued, particularly with the clarification of the 'close and substantial connection' rule in 2006 which allowed those participating in domain name monetisation to enter the .au market for the first time.

These combined factors meant that by 30 June 2006, there were 710,428 .au domains under management – a growth of 252% in four years.



7 Australian Bureau of Statistics; 8128.0 "Household Use of Information Technology, Australia, 1996" <<http://www.abs.gov.au/AUSSTATS/abs@.nsf/allprimarymainfeatures/567388B8C47A766CFA25722E001BFE48?opendocument>>

8 Australian Bureau of Statistics; 8146.0 "Household Use of Information Technology, Australia, 2002" <<http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/8146.02001-02?OpenDocument>>

9 Australian Bureau of Statistics; 8146.0 "Household Use of Information Technology, Australia, 1998" <<http://www.abs.gov.au/AUSSTATS/abs@.nsf/Previousproducts/8146.0Media%20Release11998?opendocument&tabname=Summary&prodno=8146.0&issue=1998&num=&view=>>>

10 AusRegistry; ".au Survey 2013" <<https://www.ausregistry.com.au/au-survey-2013/>>

The decade of consolidation

2006 – 2016

In the third decade of .au there has been a maturation of the domain name landscape with the introduction of innovation through policy changes, now reflected in the confidence Registrants and Internet users hold for the .au ccTLD.

It has also been a decade of rapid growth with a million domains being added approximately

every four years. In April 2006 there were 675,505 .au domain names registered and the 1 millionth domain was registered in November 2007. Today there are more than 3.036 million domains registered across the second-level domains. Of these, com.au accounts for 2.66 million, or 87 percent¹¹.

This maturation has in part led to increasing confidence in .au as changes that have come about are user driven and aim to protect integrity and usability.

One major change came in 2008, when registrants were first allowed to transfer their domain name to another registrant for any reason, as a result of recommendations from the Names Policy Panel in 2007.

This had a major impact in allowing the sale of domain names rather than previously where the only way a domain name could be sold was if there was some form of intellectual property attached, such as a business.

Public consultations have also led to other major changes, such as allowing for domain monetisation under the 'close and substantial connection' rule.

These changes contribute to increased confidence in an industry that seems to never sleep. There are regularly new challenges, such as the introduction of new gTLDs which began in February 2014. However developments over the years mean the .au landscape is not static and changes with demand from the domain name community.

“It has been a decade of rapid growth with 1,000,000 domains being added approximately every four years”

A decade of securing .au

.au is one of the world's most trusted and secure TLDs, in part due to the work done largely behind the scenes by AusRegistry and auDA, implementing some of the leading technologies such as DNSSEC and .auLOCKDOWN.

The importance of ensuring .au is kept up and running with the latest technologies goes without saying. If the entire ccTLD goes down or a domain name is surreptitiously hijacked there can be huge financial and reputational losses – including to the reputation of AusRegistry and auDA.

One incident in 2011 led to major changes and a world-first, new security standard. In what was arguably the worst security incident in the three-decade history of .au, a Registrar was hacked, resulting in loss of data that meant their customer's websites and domain information were unrecoverable, impacting on many thousands of businesses across Australia¹².

As a result the Registrar folded and damages were estimated to be in the range of tens of millions of dollars. This led to two years of consultations between auDA, AusRegistry and the industry on how Registrar security threats can be better addressed, from which the Information Security Standard (ISS) for .au Registrars was developed and launched in 2013.

ISS is a set of mandatory protocols that helps manage and improve the security of a Registrar's infrastructure and systems, as well as protecting the stability and integrity of the .au namespace.

Another security improvement was the deployment of DNSSEC in 2014. DNSSEC was deployed to ensure .au became a more secure namespace in a world where security is continually being tested. DNSSEC works by digitally signing data so that when an Internet user visits a domain name they know it is legitimate.

A third major improvement was the implementation of .auLOCKDOWN. This measure provides a high level of security preventing unauthorised changes to nameserver data. Its implementation followed a number of incidents in other TLDs where cyber attackers attempted to hijack websites by infiltrating Registrar servers or by fraudulently posing as an authorised employee.

“If the entire ccTLD goes down or a domain name is surreptitiously hijacked there can be huge financial and reputational losses”

¹¹ AusRegistry; .au Registry data

¹² AusRegistry; "Lessons learnt from the Distribute.IT cyber security incident", <<https://www.ausregistry.com.au/lessons-learned-from-the-distributeit-cyber-security-incident/>>

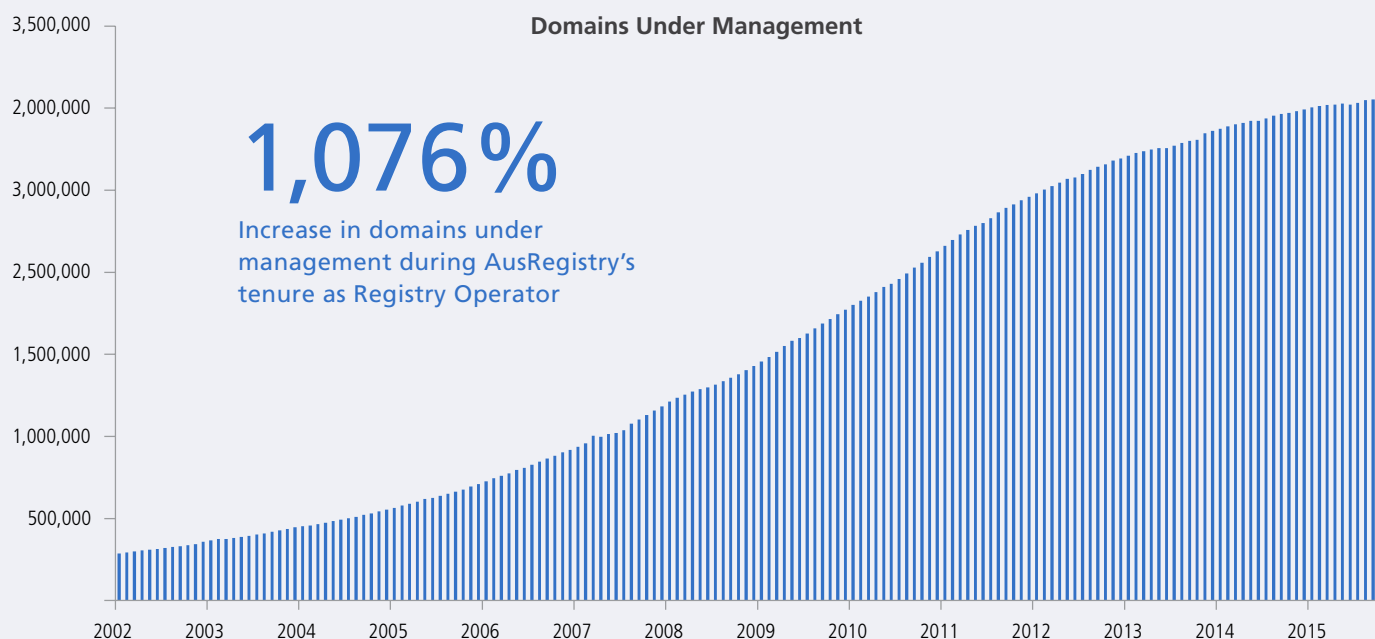
2011

2013

2015

2012

2014



The digital economy transforms Australia, with a little help from .au

The digital economy's contribution to the broader Australian economy is big. In 2013-14 Deloitte Access Economics valued the contribution of the digital economy at \$79 billion, or 5.1 percent of GDP, up from \$50 billion in 2011 – and they estimate that the digital economy could be worth \$139 billion by 2020 (7.3% of GDP)¹³.

The report, entitled 'The Connected Continent II: How digital technology is transforming the Australian economy', estimates "the economy was about \$45 billion bigger in 2013 than it otherwise would have been because of the positive impact of digital technologies on Australian productivity."

Not only is the digital economy growing, it's also changing our lives in ways we can't predict. For example, in America it's been estimated "that 45 percent of American jobs are at high risk of being taken by computers within the next two decades."¹⁴

The Domain Name System is one of the glues that holds the digital economy together. While not huge in its financial contribution, it is also often the cheapest contributor to helping a business get online.

Getting online allows a business to connect with new clients and more easily connect with existing ones. It can reduce overheads and allow better communication. And the landscape is rapidly changing. As the Deloitte report notes:

"Just a few years ago, most consumers logged on to the internet to access email, search the web, and do some online shopping. Company websites functioned as vehicles for corporate communication, product promotion, customer service and, in some cases, e-commerce. Today digital technology, including cloud platforms, smart devices and social networks, is reinvigorating the sweeping impact of the internet. Rapidly evolving from basic connectivity, these technologies are fundamentally changing how consumers interact with business and how businesses operate more broadly."

Research by the Australian Bureau of Statistics reinforces the Deloitte research. Among Australian businesses, the ABS found just under half (48.6 percent) had a web presence.¹⁵ The majority of those without a web presence will be smaller businesses – and they're missing out.

In the United Kingdom, research published in May by Nominet found tradespeople with their own website picked up an additional 21 jobs a year, on average worth £16,590 (\$33,700). Over a third (39 percent) are winning jobs outside their main patch while 36 percent pull in jobs from clients with heavyweight budgets.¹⁶

The opportunity for domain name growth, particularly among small businesses and individuals, just like with the digital economy, is huge. Registrars and other key players in the domain name world should be ready, developing marketing and tools to take advantage of this opportunity.

¹³ Deloitte Access Economics; "The Connected Continent II: How the internet is transforming the Australian economy" <<http://www2.deloitte.com/au/en/pages/economics/articles/connected-continent.html>>

¹⁴ Aviva Hope Rutkin "Report Suggests Nearly Half of U.S. Jobs Are Vulnerable to Computerization" MIT Technology Review <<https://www.technologyreview.com/s/601507/seven-must-read-stories-week-ending-may-21-2016/>>

¹⁵ Australian Bureau of Statistics "8129.0 - Business Use of Information Technology, 2014-15" <<http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/8129.0Main+Features12014-15>>

¹⁶ "Britain's Tech-savvy Tradespeople Hammer Home An Extra £16k A Year" Nominet news release <<http://www.nominet.uk/britains-tech-savvy-tradespeople-hammer-home-an-extra-16k-a-year/>>

2016 – 2026

In April 2016, auDA announced the decision to introduce direct registrations under .au, after the Board accepted the recommendations of the 2015 Names Policy Panel.

This is a significant milestone in the lifespan of the namespace, and marks one of the biggest changes to .au in recent

history. The Board agreed with the majority views expressed in the Panel's final report that the introduction of direct registrations would have several benefits including greater availability of shorter domain names, increased choice for consumers and a more attractive choice for individuals, as well as responding to market demand and strengthening the .au brand.

Following the announcement of the Board's decision, auDA will now begin a comprehensive policy development process and further stakeholder consultations to determine the best approach for implementing direct registrations in .au.

Further developments and announcements will be reported in future editions of *Behind the Dot*.

The future of technology and the Internet in Australia

If the last 30 years in .au's lifespan have taught us anything, it is that the evolution and progress of technology moves at a significant pace and has a far-reaching impact on the world we live in. In Australia, the business and personal implications of the rise

of information technologies such as computers and the Internet have been so notable that in three decades, the way we live, work and interact has been irrevocably changed.

Predicting the next stages in this journey can be an enormous task, with many varying and diverse opinions on the most important developments for the continued growth of Australian society.

“ Australian businesses are already realising that an online presence and the ability to adapt to new technologies are imperative to future-proofing their organisation for success ”

Futurist, author and inventor Mark Pesce told AusRegistry that augmented reality systems such as Microsoft HoloLens, artificial intelligence systems like IBM Watson and knowledge sharing systems such as Wikipedia will have the most profound impact on Australian businesses in the next decade.

In particular, Mr Pesce stresses the importance of very high speed broadband as a step Australia must take to remain competitive in an increasingly technological world. “Australia needs very high speed broadband everywhere,” he said. “There is no other important action until this happens, and after this happens everything changes.”

To keep up with this innovation, Mr Pesce suggests the successful businesses of the future will “transition to mobile-first connections with customers; re-vision themselves as services; and integrate their services with the services their customers, vendors and competitors offer to create new products.” Australian businesses are already realising that an online presence and the ability to adapt to new technologies are imperative to future-proofing their organisation for success.

A report on technology and Australia's future published in 2015 by the Australian Council of Learned Academies (ACOLA) suggested Australia needs to establish an “adapt or wither” mindset, with a focus on remaining future-minded to ensure our continued success and growth as a country and an economy.

“Australia needs to adapt to the shifting foundations. It needs to change its strategy from focusing upon that worked well in the past, or business sectors that have been demonstrated to have strengths in the past. Instead Australia should create and sustain the capacity, skills, culture and the will to adopt, adapt, and develop its future source of prosperity and well-being: Australia's bright future can be envisaged, created and achieved through new technology.”¹⁷

30 years of .au feature compiled by Maggie Whitnall, Alison Coffa and David Goldstein, with thanks to Narelle Clark, Dr Peter Thorne and Mark Pesce for their contributions.

DNS & security

Paul Wilson is the Director General of APNIC, the organisation in the Asia Pacific responsible for distributing and managing IP addresses, performing much of its work out of sight of everyday Internet users. David Goldstein sat down with Paul to discuss APNIC's role and why it is so important.

The following is part two of their conversation, discussing IPv4 depletion and APNIC's perspective on the transition to IPv6. In part one, Paul spoke about APNIC as an organisation and some of the local and global issues it deals with on a daily basis. You can read part one in Edition 7 of Behind the Dot, published in May 2016, <https://ausregistry.com.au/research-au>

DG: *One of the big issues APNIC deals with is the IPv4 depletion. There were more than four billion IPv4 addresses to allocate globally and there are around 310 million domain names registered around the world. How have we run out of IPv4 addresses?*

PW: An IP address is required for each device connected to the Internet – this includes both the equipment which is used in back-end infrastructure, and every connected device used by Internet users. Currently there's an estimated 25 billion devices connected to the Internet – that's a lot more than the total IPv4 size of 4 billion addresses, and is only achieved because of network address translation technologies that allow individual IPv4 addresses to be shared. But this technology comes with a cost to the Internet, and its expansion cannot go on forever.

Currently there's an estimated 25 billion devices connected to the Internet

Of course, the demand for Internet addresses will only continue to grow. An estimated 40 percent of the world's population currently has Internet access, and this is predicted to rise to 50 percent by 2017. At the same time, the number of devices connected to the Internet will grow massively, as mobile broadband and the Internet of Things become a reality.

Around 50 billion devices will be connected to the Internet by 2020. That's double where we are now. Even if another billion addresses could be made available on the market, it's abundantly clear that the only way to support Internet growth in the next five years is through adoption of IPv6, the next generation of IP addresses.

By the way, domain names are not limited in the same way as IP addresses; they occupy a space which can be expanded without limitation. Also since a domain name is required only by servers and services, and not by end-user devices, there is no practical risk of running out of domain names.

An estimated 40% of the world's population currently has Internet access, and this is predicted to rise to 50% by 2017

DG: *What impact does the IPv4 depletion have on domain names? How many IPv4 addresses do you have left to allocate?*

PW: IPv4 exhaustion does not directly affect domain names. The DNS provides the directory service which automatically translates a given domain name into its associated IP address (IPv4 or IPv6), and multiple domain names can point to a single IP address.

DNS servers and services must be upgraded in order to support IPv6, and it is important therefore for domain name Registries and Registrars to properly support IPv6 for the domain names and Registrants that they serve. Even if a user has deployed IPv6 on their services, they may still find that their Registry or Registrar cannot support the administration of IPv6 addresses for their domain name. Until the entire DNS industry supports IPv6, some registrants may need to switch to alternative service providers in order to support their own IPv6 services.

Regarding what's left of the IPv4 space to allocate, the answer is very little. Globally there are only 55.7 million addresses left to allocate, or 1.5 percent of the total space. In the Asia Pacific, APNIC has roughly 9.6 million addresses left. Policies developed by the APNIC community allow for small amounts of the remaining addresses to be distributed to those organisations that need them, but even with rationing in place, APNIC's remaining supply is expected to run out in around four years.

It really is time for network operators to move to IPv6.

**Around 50 billion devices
will be connected to the
Internet by 2020**

DG: *The transition to IPv6 means there are billions more IP addresses available. What will be the benefits of this, to both businesses and internet users?*

PW: IPv6 offers an enormous number of addresses: a future Internet of 100 trillion devices would only consume a mere 5 percent of the available IPv6 space. However in order to take advantage of IPv6, Internet Service Providers (ISPs), businesses and consumers will often need to upgrade existing Internet-related hardware and software.

Theoretically speaking, IPv6 is designed to invisibly replace IPv4, making no immediate difference to Internet users. However, the negative impacts of not moving to IPv6 – and increasing the use of Network Address Translation (NAT) technology to extend the lifespan of IPv4 – will begin to become apparent in terms of competition, Internet access, pricing, performance and innovation.

Imagine this theoretical future if IPv6 is not adopted: the scarcity of addresses will make it difficult for new Internet start-ups who need IPv4 to operate their online businesses, limiting growth and also favouring incumbent providers with existing IPv4 address holdings. The increasing cost of obtaining IPv4 addresses, and the increasingly complex networking technology required to extend IPv4 addresses, will inevitably flow to users. Performance will be degraded by Internet traffic having to flow from one NAT to the next before reaching its destination. That's if those packets actually reach their destination; the

**Globally there are only 55.7
million addresses left to
allocate, or 1.5% of the total
space. In the Asia Pacific,
APNIC has roughly 9.6 million
addresses left**

widespread adoption of NAT technologies will steadily degrade the ability of Internet devices to connect to one another and with it, the global connectedness of the Internet. In turn, the applications used by devices will rely increasingly on application-specific servers, which become less distinguished from the network infrastructure itself, compromising the neutrality and efficiency of the Internet's basic infrastructure.

This may sound a bit like a doomsday scenario; but it's entirely plausible if IPv6 adoption doesn't continue to increase. It is also a scenario which may occur unevenly, within those countries or regions in which IPv6 is not deployed widely, creating the prospect of a new "digital divide" with respect to IPv6 deployment. The good news is that IPv6 adoption is accelerating and in economies like the United States we can see major ISPs and content providers making the shift.

**IPv6 offers an enormous
number of addresses: a
future Internet of 100 trillion
devices would only consume
a mere 5 percent of the
available IPv6 space**

Lastly, the popular concept of the Internet of Things (IoT) – which, really, is just the Internet on a bigger scale – can only become a reality with successful deployment of IPv6. While this is well known by many IoT developers and vendors, it may not be well-recognised by all stakeholders in this exciting technical trend.

DG: *What has been the adoption rate been for IPv6 and how does APNIC view this?*

PW: Historically, IPv6 adoption has been uneven around the world, and also within the Asia Pacific region. In recent years however, adoption has accelerated with the progressive exhaustion of IPv4 address space around the world. APNIC Labs currently measures global IPv6 capability at just over 5 percent, while Google's statistics show that more than 10 percent of its visitors are using IPv6. In each case, growth rates are exponential, so we can expect large ongoing increases in coming years.

A number of large and well-known service providers are now implementing IPv6 in full production, with



services provided by default to large user populations. Facebook's network is almost entirely IPv6 right now; big service providers such as Verizon, Comcast and AT&T operate large production IPv6 networks, and others such as BT and Virgin in the UK have committed to significant IPv6 targets in the coming 12 months.

In the Asia Pacific, Telecom Malaysia is doing a good job with IPv6, as are companies like KDDI and Softbank in Japan, and Korea Telecom. I know many other large service providers are doing trials right now, and are advanced in their IPv6 deployment planning. IPv6 certainly has some momentum now and the next few years will certainly produce more success stories.

The popular concept of the Internet of Things can only become a reality with successful deployment of IPv6

DG: *Are there any technical issues that users of IP addresses need to consider when adopting IPv6?*

PW: For consumer Internet services, IPv6 support will be provided invisibly so that user activities are not disrupted. This is important for ISPs, because the cost of providing technical support for user problems is relatively large, enough to eliminate per-user profit margins for a very modest level of support. Ideally, ISPs will provide a "dual stack" service, with IPv6 capability added to an existing IPv4-based service; and users with IPv6-compatible modems and computers will then automatically use IPv6, from software that supports it. In all other cases IPv4 will continue to be used.

Likewise in the case of mobile Internet access, IPv6 will be provided invisibly and should not be noticeable. It is important to understand that if an IPv6-only service is provided, then software and apps which do not support IPv6 will not function. For this reason Apple's recently announced requirement for IPv6 support in all apps is important.

For business users, it will be more important to analyse IPv6 service performance and compatibility of business systems, to ensure that services received will continue to meet business needs. In particular IPv6 services must provide adequate performance and stability, while internal business software must support IPv6 access before the discontinuation of ISP IPv4 services.

Finally for users involved in providing services on the Internet, the technical requirements of IPv6 support in servers and services must be investigated very carefully. This can be a significant challenge, relying on suitable expertise on the part of those who are designing, building and supporting such services.

IPv6 is different from IPv4 and does require network operators to upgrade technology and invest in training for network professionals. The good news is that costs can be minimised by planning ahead, for instance by ensuring IPv6 capabilities are gained within the normal hardware and software upgrade cycles. APNIC provides low-cost IPv6 training around the region to help network operators develop the skills and expertise needed to manage an IPv6 network.

However, it's important to remember that the shift to IPv6 has been anticipated for many years, and none of these developments will come as a surprise to network operators.

To find out more about APNIC and its programs, visit www.apnic.net.

MEMBER BENEFITS

**AUSTRALIANS VIEW .au AS A TRUSTED SPACE
ON THE INTERNET. IF YOU CARE ABOUT THE
INTERNET IN AUSTRALIA, BECOME A MEMBER**

auDA MEMBERSHIP BENEFITS:

- A VOICE IN THE FUTURE OF .au
- VOTE IN auDA BOARD ELECTIONS
- FREE ENTRY TO AUIGF
- INVITATIONS TO SPECIAL EVENTS
- QUARTERLY MEMBERS' NEWSLETTER
- AND MORE...

www.auda.org.au/Membership



...

**BECOME AN
auDA MEMBER
TODAY & HAVE
YOUR SAY**

Governance & policy



Jo Lim, Acting CEO, .au Domain Administration (auDA) discusses how not-for-profit organisations can use video content to optimise engagement levels.

Thirty years of .au also marks 15 years that auDA has been the .au administrator. As one of auDA's first employees, I feel very privileged to be able to look back and reflect on some of our key achievements over this time:

- In 2002 we introduced a new regulatory framework, including standardised policy rules for .au domain names, and industry competition in the .au market to replace the previous monopoly arrangements.
- Also in 2002 we released 3,000 previously unavailable generic com.au domain names through an auction process. The most valuable name was www.flowers.com.au, which sold for \$150,000.
- In 2004 we won a landmark ruling in the Federal Court of Australia against domain name renewal scammers, helping to keep our industry largely clear of this type of behaviour.
- In 2005 we released previously unavailable geographic names in com.au and net.au, and the following year we released previously unavailable two-letter domain names.
- In 2008 we facilitated the introduction of a secondary market in .au domain names, paving the way for a number of new commercial service providers in this area.

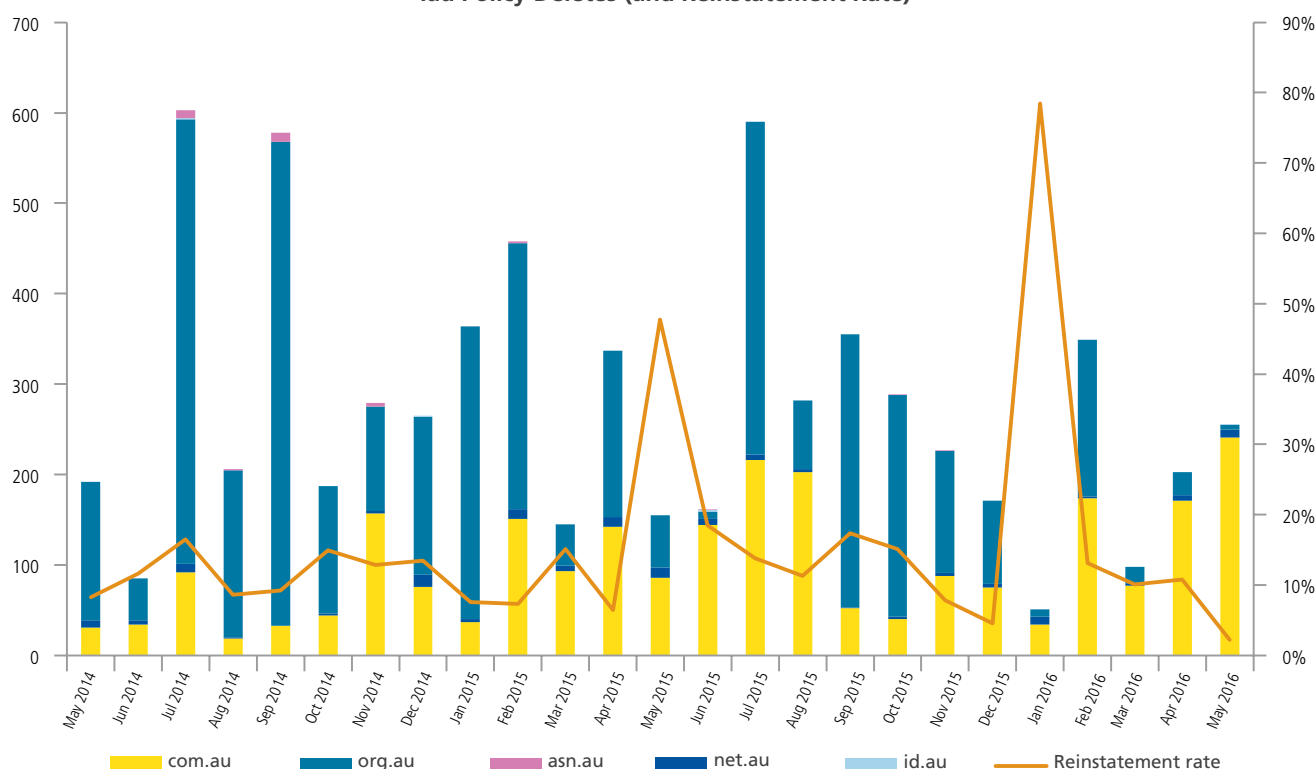
- In 2009 we launched the Australia and New Zealand Internet Awards (ANZIs), and in 2011 we held the first Australian Internet Governance Forum (auIGF). Both of these events have grown to become annual highlights for auDA and the industry.
- In 2013 we introduced a world-first Information Security Standard (ISS) for accredited Registrars, to enhance the security practices and improve consumer protection in our industry.
- In April this year, we announced that we will introduce direct registrations in .au, marking yet another evolution of our namespace.

Of course, auDA didn't achieve all of these things on our own, and it's important to acknowledge the role played by many participants in the multi-stakeholder model that underpins the DNS in Australia and around the world.

I would like to take this opportunity also to acknowledge former auDA CEO Chris Disspain, who left the organisation in March after 16 years at the helm. Chris provided the strong leadership and vision that enabled auDA to achieve all the milestones I've mentioned above, and many more besides.

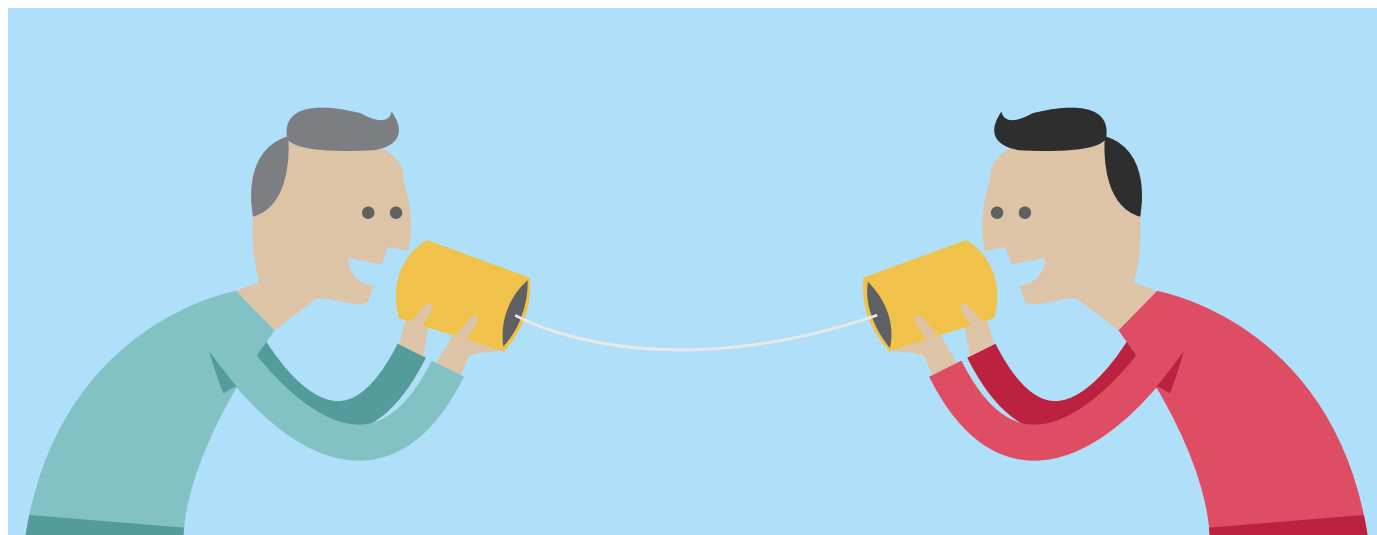
Happy 30th Birthday to .au, here's wishing us all many happy returns!

.au Policy Deletes (and Reinstatement Rate)



Channel talk

'In your opinion, what do you think has been one of the most significant milestones for the .au namespace and why?'



Jacqui Lefevre – Managing Director; Domain Registration Services

The introduction of auDA's Domain Name Eligibility and Allocation Policy Rules for Open second-level domains, which came into force on 1 July, 2002.

Prior to auDA's policy, .au domain name licenses were restricted to one per entity and a "derivation" rule existed whereby an applicant's proposed domain name had to derive from their registered business or company name in sequential order from left to right. This was not only awkward but also quite prohibitive with regards to potential domain name variations.

The new allocation policy made a world of difference in allowing registrants to hold multiple domain name licenses. It also provided for broader choices in that a .au domain name could now be an exact match, abbreviation or acronym of the registrant's name or otherwise closely and substantially connected to the registrant.

This freeing up of restrictions was widely welcomed as it provided registrants with additional options whilst still retaining the integrity of the .au domain name space.

Luke Richards – Head of Account Management, Australia; NetNames

The most significant milestone for the .au namespace is definitely the deregulation of the industry and introduction of the competitive model in 2002. Registrants today are now blessed with more choice, which never would have occurred to the level it does today had the doors to competition not been opened back then.

Angelo Giuffrida – Chief Executive Officer; VentralP Australia

There have been a couple of notable milestones for the .au namespace over the past few years but the ones that stand out to me most are the introduction of the Information Security Standard (ISS) for accredited Registrars, auDA's clarification on auto-renewal, and most importantly the auDA Board's decision to accept the 2015 Names Policy Panel's recommendation of direct registrations in .au

The introduction of auDA's ISS standard has strengthened the reputation of the .au namespace in the way that it provides Registrants with peace of mind in knowing their Registrar of choice is operating under important security

minimums and standards, whilst auDA's clarification on auto-renewal for .au domain names has provided a consistent experience for all .au domain name holders irrespective of their Registrar of choosing, encouraging further competition and removing all stigma and grey area surrounding auto-renewals.

Most importantly though, the decision by the auDA Board to accept the recommendation of direct registrations in .au will allow our niche – but vital – ccTLD to fairly compete against both gTLD and newTLD domain names alike when being considered as the primary domain name for new businesses starting in or entering the Australian market. This will not only propel .au into the future but also cement the importance of .au domain names to Australians in the global domain name marketplace.

Want to contribute to the next 'Channel Talk' feature?

Channel Talk compiled by Courtney Fabian and Lucian Popaly. To contribute to Channel Talk, please contact behindthedot@ausregistry.com.au.

Advertise with us



Access a highly engaged
audience of 3,000

e-mail us at behindthedot@ausregistry.com.au

A focus on a competitive, digital future for Australia

Australian Internet Governance Forum (auIGF)

11 & 12 October 2016

FULL PRICE
TICKETS ONLY

\$90

PER PERSON

STUDENT
TICKETS ONLY

\$36

PER PERSON

Register soon or you'll miss out

YOU CAN DO THAT HERE AT WWW.IGF.ORG.AU/REGISTRATION

A DDOS ATTACK
JUST ATE \$16M
IN REVENUE.
ALONG WITH
HIS ANNUAL
BONUS.



ALI CARTER // CIO

DDoS attacks are costly. Revenues tank. Your brand gets smacked. Sometimes malware slips in. Neustar can help. With flexible solutions for DDoS mitigation, we'll deliver exactly the defense you need from the threats you face. **Learn more at www.neustar.biz/services/ddos-protection.**

neustar

All characters appearing in this advertisement are fictitious.
Any resemblance to real persons, living or dead, is purely coincidental.

©2015 Neustar, Inc.

Glossary

Abbreviations

2LD

Second Level Domain

AARNET

Australia's Academic and Research Network

ABS

Australian Bureau of Statistics

ACCAN

Australian Communications Consumer Action Network

ACS

Australian Computer Society

ANZIAS

Australia and New Zealand Internet Awards

APNIC

Asia-Pacific Network Information Centre

auDA

.au Domain Administration

auIGF

Australian Internet Governance Forum

CSIRO

Commonwealth Scientific and Industrial Research Organisation

ccTLD

Country Code Top Level Domain

DNS

Domain Name System

DNSSEC

Domain Name System Security Extensions

gTLD

Generic Top level Domain

IANA

Internet Assigned Numbers Authority

ICANN

Internet Corporation for Assigned Names and Numbers

ICT

Information and Communications Technology

IDN

Internationalised Domain Name

IP

Internet Protocol

ITU

International Telecommunication Union

TDUM

Total Domains Under Management

TLD

Top-Level Domain

Definitions

Asia-Pacific Top Level Domain Association (APTLD)

APTLD is an organisation for ccTLD registries in Asia-Pacific region. APTLD was originally established in 1998, and in 2003 legally established in Malaysia. APTLD works as the forum of information exchange regarding technological and operational issues of domain name registries in Asia-Pacific region.

Australia's Academic and Research Network (AARNet)

A national resource – a National Research and Education Network (NREN). AARNet provides unique information communications technology capabilities to enable Australian education and research institutions to collaborate with each other and their international peer communities.

Australian Bureau of Statistics (ABS)

The ABS is Australia's national statistical agency, providing trusted official statistics on a wide range of economic, social, population and environmental matters of importance to Australia.

Australian Communications Consumer Action Network (ACCAN)

Australia's peak body for consumer representation in communications.

Australian Computer Society (ACS)

The Australian Computer Society is the professional association for Australia's Information and Communication Technology (ICT) sector.

Australia and New Zealand Internet Awards (ANZIAS)

The ANZIAS are a collaboration between auDA and InternetNZ. An annual event celebrating the achievements of organisations, businesses and individuals who excel in delivering accessible, innovative, informative and secure resources to a diverse and wide community on the Internet.

.au Domain Administration (auDA)

The policy authority and industry self-regulatory body for the .au domain space.

Australian Internet Governance Forum (auIGF)

Developed by auDA, the auIGF provides a unique opportunity for all who use the Internet in Australia to share ideas and experiences, discuss Internet-related policy, identify issues and engage with each other in a multi-stakeholder forum.

.auLOCKDOWN

.auLOCKDOWN a security measure for .au domain names that provides an added level of security for domain name Registrants. Domain names are locked at the Registry level, and changes are only possible through direct communication between the Registrar authorised contact and the Registry, by following a strict authentication process.

AusRegistry

The Registry Operator for the open 2LDs (com.au, net.au, org.au, asn.au, and id.au); the community geographic 2LDs (act.au, nsw.au, nt.au, qld.au, sa.au, tas.au, vic.au and wa.au); and two closed 2LDs (edu.au and gov.au).

Commonwealth Scientific and Industrial Research Organisation (CSIRO)

The CSIRO is the federal government agency for scientific research in Australia.

Country Code Top Level Domain (ccTLD)

A TLD that is used to represent a country or external territory. Some examples of ccTLDs are '.uk' for the United Kingdom, and '.au' for Australia.

Domain Name/Domain

An identification string that defines a realm of administrative autonomy, authority, or control on the Internet. Domain names are formed by the rules and procedures of the DNS. Any name registered in the DNS is a domain name.

Domain Name System (DNS)

A hierarchical distributed naming system for computers, services, or any resource connected to the Internet or a private network. It associates various information with domain names assigned to each of the participating entities. Most prominently, it translates easily memorised domain names to the numerical Internet Protocol (IP) addresses needed for the purpose of locating computer services and devices worldwide.

Domain Name System Security Extensions (DNSSEC)

Domain Name System Security Extensions (DNSSEC) is a security extension that facilitates the digital signing of Internet communications, helping to ensure the integrity and authenticity of transmitted data.

Internationalised Domain Name (IDN)

A domain name that includes characters from scripts other than the 26 letters of the Latin alphabet (a–z). An IDN can contain Latin letters with diacritical marks, or may consist of characters from non-Latin scripts.

Internet Assigned Numbers Authority (IANA)

A department of ICANN, which oversees global Internet Protocol (IP) address allocation, autonomous system number allocation, root zone management in the DNS, media types, and other IP-related symbols and numbers.

Information and Communications Technology - ICT

ICT refers to technologies that provide access to information through telecommunications. It is similar to Information Technology (IT), but focuses primarily on communication technologies. This includes the Internet, wireless networks, cell phones, and other communication mediums.

Internet Corporation for Assigned Names and Numbers (ICANN)

The global DNS administrator, formed in 1998, is a non-profit public-benefit corporation with global participants dedicated to keeping the Internet secure, stable and interoperable. It promotes competition and develops policy on the Internet's unique identifiers.

Internet Protocol (IP) Address

An IP Address is the numerical address by which a location in the Internet is identified. Computers on the Internet use IP Addresses to route traffic and establish connections among themselves; people generally use the human-friendly names made possible by the Domain Name System.

International Telecommunication Union - ITU

ITU is the United Nations specialized agency for information and communication technologies – ICTs.

IPv6

Internet Protocol (IP) addresses uniquely identify devices on the Internet. Currently, almost all devices connected to networks use the IP version 4 (IPv4) address system. IPv4 has more than 4 billion possible address combinations, but these are being used up quickly. APNIC reached its last block of IPv4 addresses in April 2011.

Internet Protocol version 6 (IPv6) was developed to ensure the continued growth and innovation of the Internet. IPv6 offers an extremely large (2128) address space, as each address is 128 bits long, rather than 32 bits.

Registrant

An entity or individual that holds a domain name licence.

Registrar

An entity that registers domain names for Registrants and in the case of the .au ccTLD, is accredited by auDA.

Registry

The registry comprises of a database of domain names registered in each 2LD and a public WHOIS service for looking up the identity of the registrant of a domain name.

Reseller

An entity appointed by accredited Registrars to increase the retail channel of .au domain names.

Second Level Domain (2LD)

The alphanumeric string before the dot and the TLD. AusRegistry is the Registry Operator for the open 2LDs (asn.au, com.au, id.au, net.au and org.au); the community geographic 2LDs (act.au, nsw.au, nt.au, qld.au, sa.au, tas.au, vic.au and wa.au); and two closed 2LDs (edu.au and gov.au).

Total Domains Under Management (TDUM)

Total number of domain names registered in the namespace.

Zone

A portion of the namespace in the DNS for which administrative responsibility has been delegated.

Data References

Domain numbers in the APTLD region:

China - .cn

www1.cnnic.cn/IS/CNym/CNymtjxxcx

Indonesia - .id

<https://www.pandi.id/content/statistik>

Japan - .jp

jprs.co.jp/en/stat

Korea - .kr

isis.kisa.or.kr/eng

New Zealand - .nz

dnc.org.nz/content/2014-09_stats.html

Qatar - .qa

domains.qa/en

Singapore - .sg

www.nic.net.sg/page/registration-statistics

Malaysia - .my

www.mynic.my/en/statistics.php

Hong Kong - .hk

www.hkirc.hk/content.jsp?id=77#!&in=/aboutHK/registration_statistics_hkirc.jsp

Disclaimer

This report has been produced by AusRegistry and is only for the information of the particular person to whom it is provided (the Recipient). This report is subject to copyright and may contain privileged and/ or confidential information. As such, this report (or any part of it) may not be reproduced, distributed or published without the prior written consent of AusRegistry.

This report has been prepared and presented in good faith based on AusRegistry's own information and sources which are believed to be reliable. AusRegistry assume no responsibility for the accuracy, reliability or completeness of the information contained in this report (except to the extent that liability under statute cannot be excluded).

To the extent that AusRegistry may be liable, liability is limited at AusRegistry's option to replacing, repairing or supplying equivalent goods or paying the cost of replacing, repairing or acquiring equivalent, or, in the case of services, re-supplying or paying the cost of having such re-supplied.

© 2016, AusRegistry Pty Ltd.



Powered by
ausregistry



Protect your business from attack

Cybercrime is alive and well in today's online environment. Unauthorised access to your website could be disastrous for both your business and your clients. Protecting your .au domain name is a positive step towards peace of mind - Safeguard your .au domain today.

Visit www.aulockdown.com.au

Participating Registrars:





ausregistry.com.au

